What's On the Surface
Teacher Background Information (SC010500)

In this introductory unit to Earth's surface features, the emphasis is on scientific description and organization. Children should build a bank of scientifically descriptive words through a series of observations and investigations. Each investigation (model) should be firmly tied to a real-world observation, either in the child's own community or in a shared experience from a vacation or video.

Children also get their first exposure to mapping in this unit. Mapping is not a concept that is easily understood by children of this age. The experiences in this unit should be considered a first exposure, not an area for assessment. The unit builds first on mapping of an area through which the class has traveled (a walking field trip) and a map of the school yard. Later children see maps of Michigan and globes. But it is important to remember that for most children these representations will be to some extent imaginary. Very few children of this age can really comprehend the relationship between a paper map and a physical place like their home state. However, by tying real observations to points on the map, you can begin to establish the foundations of understandings that will be more fully developed in later years.

The concept of "model" is an extremely important one, as well. Models are not only physical representations. In scientific research, models are more often mathematical equations or computer algorhythms. But for children, the easiest models to understand are physical ones. Students create two models of surface features, in Lesson 2 and again in Lesson 10. In the first model they are representing an area that they have recently visited. In the second, they represent landforms that are more theoretical—those they have studied and/or read about in informational or fictional reading. This sequence represents an increase in understanding for most children.

Michigan Landforms

While the landforms of many states have been influenced by major (but *very slow*) movements of the crust of the Earth, Michigan's hills and valleys are almost all the result of more recent—and geologically more rapid—changes. Most of the hills and valleys in Michigan are the result of the movement of the glaciers. The last glaciers receded from Michigan about 10,000 years ago and the scraps and scrapes from its retreat are still visible across the state. Low, dimpled areas of lakes (like the Bloomfield area or Houghton Lake) are the result of glacial melt. High hills are sometimes actually glacial "parks"—areas of land that were depressed by a glacier and then recoiled. Long snakelike esker hills and rounded moraines are gravelly remnants of glacial melt. And when we run into a large igneous boulder in a flat, sedimentary farmer's field, we can almost always deduce that a glacier left it behind.

But there are exceptions. The western Upper Peninsula of Michigan is strikingly different. Its igneous rocks are very old—part of the "Canadian Shield" or heart of the old continent. And in a few parts of Michigan (chiefly northeastern Michigan) scattered valleys are actually the collapsed roofs of underground rivers through soluble limestone—Karst topography.

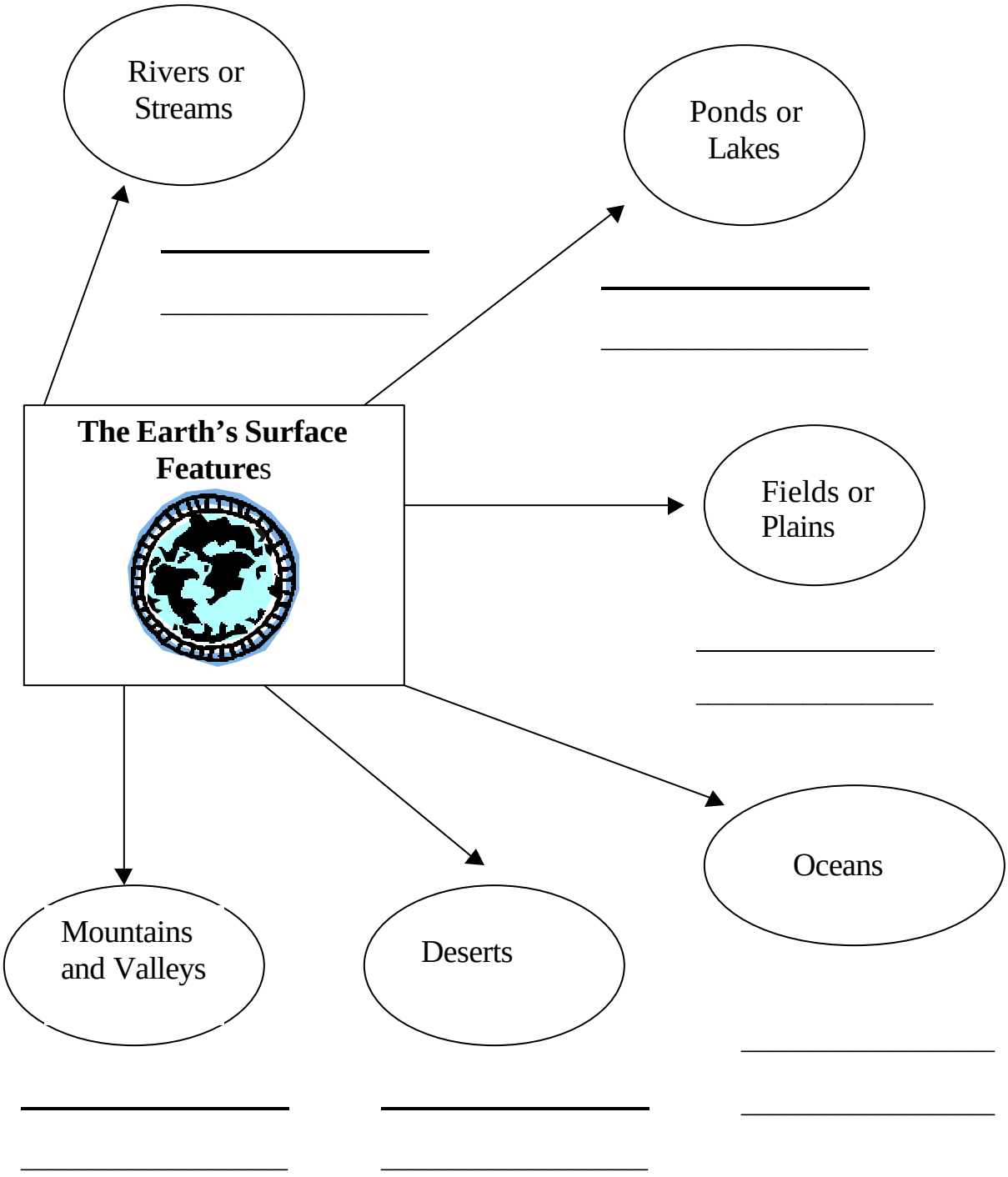
Many of Michigan's rivers have been dammed for hydroelectric power, but still flow strongly. Unlike rivers in the western United States, floods are relatively uncommon. The heavy forests of Michigan act as a watershed (like a giant sponge) absorbing rain and snowmelt and releasing it more slowly than the drier lands in the west.

Lakes and ponds are the most common familiar landforms in Michigan. Technically, a lake is an area that is deep enough that some parts never receive light to the bottom. A pond is shallow enough that at some time of the year, light penetrates to the bottom all over. That makes the maximum depth of a pond about 2 to 3 meters.

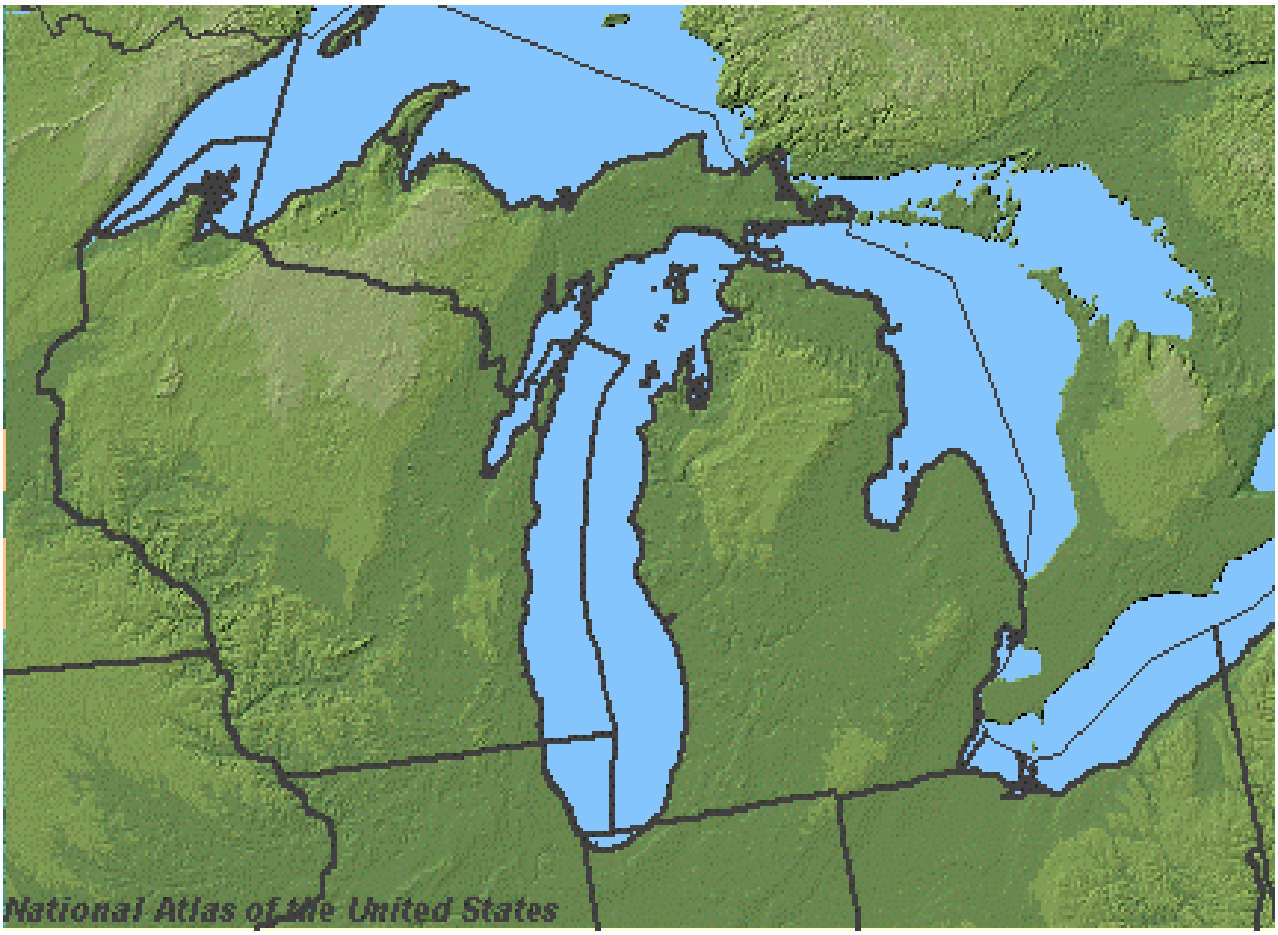
Using Power Point with Children

Teachers have found that even very young children now enjoy creating hypertext with programs such as Power Point. It is easy to use in the classroom. Because digital pictures can be immediately processed and printed, it is easier for children to see the connection between what they observe and the displays and publications they make.

For Lessons 1 and 2 of this unit, you can combine student photos into a Power Point presentation easily. Select a "new presentation," and then for each slide select a template page with a picture and include a little text. Hit the space for the photo with your mouse, and click "insert picture." You can then browse your disk for the picture you want. To begin the lesson, do not fill in the text portion of the page template. Wait until children have had an opportunity to observe and comment on their pictures. Then return to each frame and double click to edit. You can add the scientific words that children have selected to identify their photos the second time around, and save your presentation for a parent night or a "tour book" of your area to share with parents.

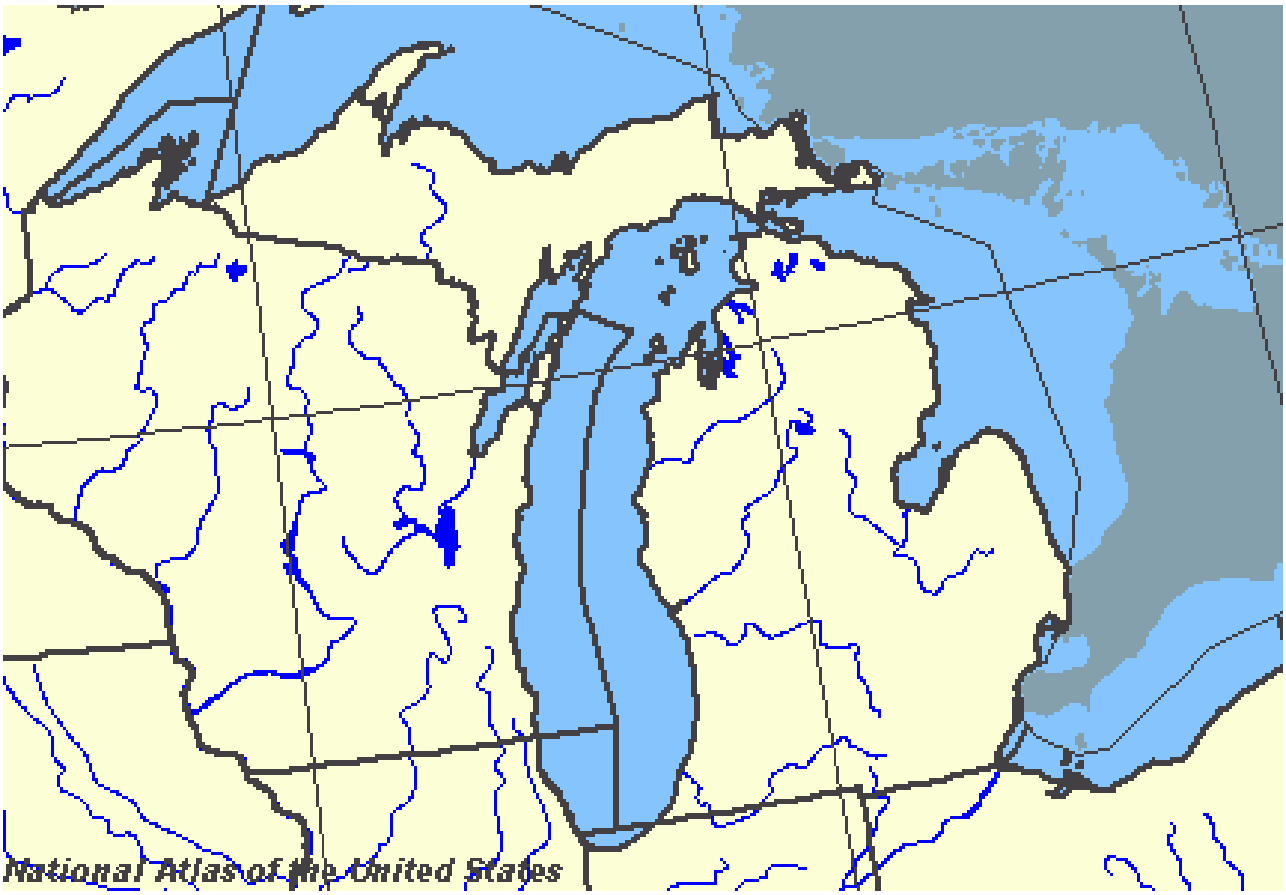

Rivers or Streams
Ponds or Lakes
The Earth's Surface Features
Fields or Plains
Oceans
Mountains and Valleys
Deserts

Mountains and Hills in Michigan (Lesson 3)



A sample of a topographic map of Michigan that could be generated from the National Atlas of the United States (www.nationalatlas.gov). To generate maps from this site, click "Make Maps" and choose your state. Then scroll down the menu of possible map elements on the right side. When you have checked those elements that you want on the map check "redraw" and then save the map to your disk by right clicking.

Water on the Earth (Lesson 6)



This is a sample of another map, showing water in Michigan, from the National Atlas of the United States. You can zoom in to the area of Michigan that includes your school.

A Michigan Lake

A Michigan dune

How can you keep cool on the desert? What color would be best?